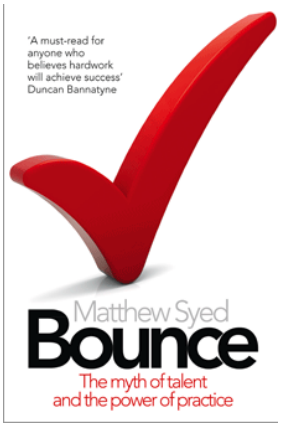
A summary of the book

Bounce

The myth of talent and the power of practice

By Matthew Syed

Summary by Kim Hartman



This is a summary of what I think is the most important and insightful parts of the book. I can't speak for anyone else and I strongly recommend you to read the book in order to grasp the concepts written here. My notes should only be seen as an addition that can be used to refresh your memory after you´ve read the book. Use my words as anchors to remember the vitals parts of this extraordinary book. I know I will. Or you can just hire me and get the content of this book as well as many others in one, beautiful package. I´m always up for a fun challenge, so bring it on.

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Description from Amazon

Essential reading following an astounding summer of sport; if you've ever wondered what makes a champion, Bounce has the answer.

What are the real secrets of sporting success, and what lessons do they offer about life? Why doesn't Tiger Woods "choke"? Why are the best figure skaters those that have fallen over the most and why has one small street in Reading produced more top table tennis players than the rest of the country put together.

Two-time Olympian and sports writer and broadcaster Matthew Syed draws on the latest in neuroscience and psychology to uncover the secrets of our top athletes and introduces us to an extraordinary cast of characters, including the East German athlete who became a man, and her husband – and the three Hungarian sisters who are all chess grandmasters. Bounce is crammed with fascinating stories and statistics.

Looking at controversial questions such as whether talent is more important than practice, drugs in sport (and life) and whether black people really are faster runners, the mind-bending Bounce is a must-read for the hardened sports nut or brand new convert.

Chapter 1: The hidden logic of success

The delusion lies in focusing on the individuality of their triumph without perceiving – or bothering to look for – the powerful opportunities stacked in their favor.

Ericson's experiment: purposeful practice was the only factor distinguishing the best from the rest. It is practice, not talent that ultimately matters.

Experiment with British music students: hour for hour, the various groups had improved with almost identical rates. The difference was simply that top performers had practiced for more hours.

A minimum of ten years is required to reach world-class status in any complex task.

Gladwell: most top performers practice for around 10 000 hours per year (it is difficult to sustain the quality of training if you go beyond that).

An arbitrary difference in birth date sets in train a cascade of consequences that, within a matter of a few years, has created an unbridgeable chasm between those who, in the beginning, were equally well equipped for sporting stardom.

The iceberg illusion by Ericsson: when we witness extraordinary feats of memory (or of sporting or artistic prowess) we are witnessing the end product of a process measured in years. What is invisible for us – the submerged evidence, as it were – is the countless hours of practice that have gone into the making of the virtuoso performance.

Anybody can achieve the same results with opportunity and dedication.

Retrieval structure: make sense of numbers and words and put them in a context. 3 4 9 2 can be thought of as 3 minutes and 49,2 seconds, a time for running a marathon.

In a nutshell, when chess masters look at the positions of the pieces on a board, they see the equivalent of a word. Their long experience of playing chess enables them to "chunk" the pattern with a limited number of visual fixations in the same way that our familiarity with language enables us to chunk the letters constituting a familiar word. It is a skill derived from years of familiarity with the right "language", not talent. (p. 24)

It's not as simple as just knowing about where to look; it is also about grasping the meaning of what you are looking at. It is about looking at the subtle patterns of movement and postural clues and extracting information. Think about a tennis player that looks at the trunk and hips of their opponents on return in order to pick up the visual clues governing where they are going to serve.

Recognition of familiar scenarios and the chunking of perceptual information into meaningful wholes and patterns speed up processes.

Speed in sport is not based on innate reaction speed but derived from highly specific practice.

The limiting factor in making a world-class stroke isn't strength or brute force, but the executive control of fine motor movement to create **perfect timing**.

Federer has practiced for so long that the movement have been encoded in implicit rather than explicit memory. This is what psychologists call **expert-induced amnesia**.

The most important differences are not at the lowest levels of cells or muscle groups, but at the athlete's superior control over the integrated and coordinated actions of their bodies. Expert performance is mediated by acquired mental representations that allow the experts to anticipate, plan and reason alternatives courses of action. (p.35)

It is practice, not talent that holds the key to success.

Study on decision-making in the real world: The curious thing was not that top-decision makers like firefighters and doctors were making choices based on unexpected favors; it was that they did not seem to be making choices at all.

Expert firefighters are able to confront a burning building and almost instantly place it within the context of a rich, detailed, and elaborate conceptual scheme derived from years of experience. They can chunk the visual properties of the scene and comprehend its complex dynamics, often without understanding how. This is extrasensory perception, a sixth sense.

What they all have in common is long experience and deep knowledge.

Knowledge-free computing, however sophisticated, is impotent. The most important ingredient in an expert system is knowledge. Programs that are rich in general inference methods – some of which may even have some of the power of mathematical logic – but poor in domain-specific knowledge can behave expertly on almost no tasks.

Expert knowledge simply cannot be taught in the classroom over the course of a rainy afternoon. Sure, you can offer pointers of what to look for and what to avoid, and these can be helpful. But relating the entirety of the information is impossible because the cues being processed by experts – in sports or elsewhere – are so subtle and relate to each other in such complex ways that it would take forever to codify them in their mind-boggling totality. This is known as **combinatorial explosion**.

Good decision-making is about compressing the informational load by decoding the meaning of patterns derived from experience. This cannot be taught in a classroom; it must be lived and learned. It emerges through practice.

Expertise is a long-term development process, resulting from rich instrumental experiences in the world and extensive practice.

To be successful, a chess player must cut down on the computational load by ignoring moves unlikely to result in a favorable outcome and concentrating on those with greater promise. Kasparov is able to do this by understanding the meaning of game situations. Deep Blue (the chess computer) is not.

An example of circumventing explosion via advanced pattern recognition: Gretzky can discern the games underlying pattern and flow, and anticipate what's going to happen faster than anyone else in the building. Several times during game you'll see hi making what seem to be aimless circles on the other side of the rink from the traffic, and then, as if answering a signal, hell dart ahead to a spot where, an instant later, the puck turns up.

Chapter 2: Miraculous children?

Child prodigies amaze us because we compare them not with other performers who have practiced for the same length of time, but with children of the same age who have not dedicated their lives in the same way.

Extensive research has shown that there is a scarcely a single top performer in any complex task who has circumvented the ten years of hard work necessary to reach the top.

A young performer has a sizeable head start on anybody who commences their training a few years later.

It is only possible to clock u meaningful practice if an individual has made an independent decision to devote himself to whatever field of expertise. He has to care about what he is doing, not because a parent or a teacher says so, but for its own sake. This is called **internal motivation**.

The only circumstances in which very early development seem to work is where the children themselves are motivated to clock up the hours, rather than doing so because of parents or a coach. The key is to be sensitive to the way the child is thinking and feeling, encouraging training without exerting undue pressure.

The dangers of starting out to hard, too young, often outweigh the benefits. One of the skills of a good coach is to tailor a training program to the mindset of the individual.

Onlookers took the performance to be the consequence of special abilities because they had witnessed only a tiny percentage of the activity that had gone into its making.

There is no evidence for differences in innate specific capacities for mathematics.

Chapter 3: The path to excellence

We do our jobs, but often with our minds absent – partially or wholly – from what we are doing. We go through the motions. This is why length of time in many occupations is only weakly related to performance. Mere experience, if it is not matched by deep concentration, does not translate into excellence. "I have not improved in five years. Why? Because I have been cruising on autopilot".

Anagrams: words where letters have been mixed. With difficult anagrams the jumble of letters force you to do something tan other than breeze through. You have to stop for a moment and think and you are forced to click out of autopilot. In those few seconds of striving, the word is imprinted on your memory.

Ericsson: when most people practice, they focus on the things that they can do effortless. Expert practice is different. It entails considerable, specific and sustained efforts to do something you can't do well – or even at all. It is only by working on what you can't do that you turn into the expert you want to become.

Purposeful practice: the practice sessions of aspiring champions have a specific and never-changing purpose: progress. Every second of every minute of every hour, the goal is to extend one´s mind and body, to push oneself beyond the outer limits of ones capacities, to engage so deeply in the task that one leaves the training session, literally, a changed person.

World class performance comes by striving for a target just out of reach, but with a vivid awareness of how the gap might be breached. Over time, through constant repetition and deep concentration, the gap will disappear, only for a new target to be created, just out of reach again.

Purposeful practice s about striving what's just out of reach and not quite making it; it is about grappling with tasks beyond the current limitations and falling short again and again. Excellence is about stepping outside the comfort zone, training with a spirit of endeavor, and accepting the inevitability of trials and tribulations. Progress is built, in effect, upon the foundations of necessary failure. That is the essential paradox of expert performance.

"Landing on your ass twenty thousand times is where great performance comes from".

China and Ping-Pong, Brazil and soccer; all the successful systems have one thing in common: *they institutionalize the principles of purposeful practice*.

What is required is ten thousand hours of purposeful practice. And for practice to be truly purposeful, concentration and dedication, although important, are not sufficient. You also need to have access to the right training system, and that sometimes means living in the right town or having the right coach.

Anders Ericsson: The body and mind can be radically altered with the right kind of practice. When the body is put under exceptional strain, a range of dominant genes in the DNA are expressed and extraordinary psychological processes are activated. PP. 85

A key aspect of brain transformation is myelin, a substance that wraps around the nerve fibers and that can dramatically increase the speed with which signals pass through the brain.

Purposeful practice also builds new neural connections, increase the size of specific sections of the brain, and enables the expert to co-opt new areas of grey matter in the quest to improve.

The very process of building knowledge transforms the hardware in which the knowledge is stored and operated.

Automaticity: When we learn a new task, like driving a car, we concentrate hard to master the skills. At first we are slow and awkward, and our movements are characterized by conscious control, but as we get more familiar, the skills are absorbed in implicit memory, and we no longer give much thought to them.

Purposeful practice is transformative.

Creative innovation: J-O transformed the service action in table tennis by holding the bat between thumb and forefinger, dramatically increasing flexibility and spin. Dick Fosbury broke the world record for high jump with a new style in which he took off from the outside foot before sailing over the bar headfirst and with his back facing downwards. Where do these paradigm shifts comes from? How do these creative leaps, which transform performance by circumventing seemingly immovable constraints, emerge?

Creative innovation follows a very précis pattern: like excellence itself, it emerges from the rigors of purposeful practice. It is the consequence of experts absorbing themselves for so long in their chosen field that they become, as it were, pregnant with creative energy. To put it another way, eureka moments are not lightning bolts from blue, but tidal waves that erupt following deep immersion in an area of expertise.

The ten years rule of creativity: What seems lie pure, untainted mystical creativity is, in fact, the consequence of lifetime devotion.

When creativity manifests itself not in artistic expression but in technical innovation, a subtle but immensely powerful interaction is created: purposeful practice changing individuals, and also changing the means of changing individuals. In stage one, experts engage in purposeful practice and, as a consequence, develop new techniques. In stage two, other individuals corral these innovations to increase the efficacy of practice, leading to new innovations in stage three, and so on.

The perfect conditions for feedback: by creating a perfectly reproducible stroke, I was able to instant identify what had gone wrong when I made a mistake, leading to automatic refinement and readjustment. If you don't know what you are doing wrong, you can never know what you are doing right. We need to know where we are going wrong if we are going to improve.

Feedback is the rocket fuel that propels the acquisition of knowledge, and without it no amount of practice is going to get you there.

Jack Nicklaus always created a clear idea of precisely what he wanted to achieve on every shot:

"*I never hit a shot, even in practice, without having a very sharp, in-focus picture of it in my head. It's like a color movie. First I see the ball where I want to finish, nice and white and sitting up high on the*

bright green grass. The scene quickly changes and I see the ball going there; its path, trajectory, and shape, even its behavior on landing."

By comparing the outcome of the shot with the color movie of his intention, he was able to learn and adapt in the most efficient way on every single stroke he ever played.

Great coaches are able to design practice so that feedback is embedded in the drill, leading to automatic readjustment, which in turn improves the quality of feedback, generating further improvements, and so on.

The evolutionary process: an evolutionary mutation is tested against the feedback of survival and reproduction, which in turn permits new mutations, which are tested once again, and so on. After a few hundred million years in this feedback loop, single-cell organisms have evolved into modern humans and the other wondrous species we see around us.

The talent theory is not merely flawed in theory; it is insidious in practice, robbing individuals and institutions of the motivation to change themselves and the society. Expertise is ultimately about the quality and quantity of practice.

Chapter 4: Mysterious sparks & life-changing mindsets

Transformational moment: Shaq O'Neill was about to quite basket, telling his mom that he could do it later. His mom responded: Later doesn't always come to everybody.

Clocking up thousands of hours of purposeful practice ultimately determines how far we make it along the path to excellence: but it is only those who care about the destination, whose motivation is internalized, who are ever going to get there.

Motivational jolts: A group of student was divided into two parts. One part were given a small detail that could be associated to themselves when studying a report of a person – such as that the person hade the exact me birth date as the students. The motivational level showed to go sky high for the students who had the same birthday.

These events are so powerful because they are small and indirect. It is called motivation by association; a small, barely noticed connection searing deep into the subconscious and sparking a motivational response.

The need to belong, to associate, is among the most important human motives. We are almost certainly hardwired with a fundamental motivation to maintain these associations.

Dwecks experiment: those students who held the belief that intelligence is set in genetic stone (the talent myth) were labeled as having a fixed mindset. Those who believed that intelligence can be transformed through effort were labeled as having a growth mindset.

The figure skater champion fell and fell. Why did she not give up? Because she did not interpret falling down as failure. Armed with a growth mindset, she interpreted falling down not merely as a means of improving, but as evidence that she was improving. Failing provided her with an opportunity to learn, develop and adapt.

Edison: if I find 10 000 ways something won't work, I haven't failed. I am not discouraged, because every wrong attempt discarded is another step forward.

Examples of talent-oriented shitheads:

- You learned that so quickly, you are so smart <MEANS> If I don't learn something quickly, I´m not smart.
- You are so brilliant; you got an A without really studying <MEANS> I´d better quit studying or they won't think I'm brilliant!

So:

We should praise effort, not talent we should emphasize how abilities can be transformed through application; we should teach others and ourselves to see challenges as learning opportunities rather than threats; we should interpret failure not as an indictment but as an opportunity.

World-class performers emerge from mindset. Perhaps the key of any institution is to encourage the adoption of a growth mindset.

Knight, the table tennis player that started to go backwards but got back on track: The growth mindset permeates his attitude not merely to table tennis but to life; his relationships, his commitments, his responsibilities to friends, teammates, and sponsors. He does not duck challenges, and he doesn't regard failure as a reason to stop striving.

Chapter 5: The placebo effect

Believing in something beyond the self can have a hugely beneficial psychological impact, even if the belief is fallacious.

The thing that often separates the best from the rest is a *capacity to believe thing that are not true but which are incredible effective*.

The example with the slider who got a salt water injection instead of morphine: the solder was not merely comforted by the injection of saltwater; he was able to tolerate the agonies of surgery as well as if he had been injected with real anesthetics.

The key point is that the power of the mind is exercised through the medium of belief, and it doesn't matter whether the belief is true or false, or how the delusion is created, so long as it is created successfully.

The placebo effect: it is the belief itself, not its content that matters.

If you expect the best, you are given some strange kind of power to create the conditions that produce the desired results.

The difference between world-class performers and mediocre performers are that they take these mental manipulations to greater extremes. They have taught themselves to ratchet up their optimism at the point of performance; to mould the evidence to fit their beliefs rather than the other way around; to activate doublethink.

Chapter 6: The curse of choking and how to avoid it

Choking is a species of failure so absolute that it looks as if there is an entirely different player out on view.

It is one aspect of choking that is universal: it only ever occurs under conditions of sever pressure.

Expert-induced amnesia: James has automated his stroke-making. Many hours of practice have enabled him to encode the stroke in implicit rather than explicit memory.

The migration from the explicit to the implicit system of the brain has two crucial advantages. First, it enables the expert player to integrate the various parts of a complex skill into one fluent whole, something that would be impossible at a conscious level because there are too many interconnecting variables for the conscious mind to handle.

Example of the transition between brain systems: when you learn to drive a car. Starting out, you have to focus on all the separate things; gears, brake etc. After you have been driving for a while, things have changed. Your skills have moved from the explicit to the implicit, from the conscious to the unconscious, and your ability has graduated from novice level to proficiency.

But think if an expert were to find himself using the wrong brain system. No matter how great he is, he would strive because he is using his explicit rather than internal system. The highly sophisticated skills encoded in the implicit part of his brain would count for nothing.

When the brain switch occurs, neither courage nor cowardice makes the least bit difference. Choking is a problem of psychological reversion: the flipping from a brain system used by experts to one used by novices.

On simple tasks, the tendency to slow down and take conscious control confers huge advantages. But precisely the opposite applies when executing a complex task. When doing a shot, a tennis pro who has direct attention towards the mechanics of the shot is likely to be catastrophic because there are too many interconnecting variables for the conscious mind to handle. Choking, then, is a kind of neural glitch that occurs when the brain switches to a system of explicit monitoring in circumstances when it ought to stick to the implicit system.

It is only an expert performer – someone who has practiced long enough to automate skill – who has the capacity to choke. For a novice – still wielding the explicit system – any additional attention is likely to benefit execution, not hinder it.

If the performer doesn't feel any pressure, there is no pressure – and the conscious mind will not attempt to wrestle control from the implicit system.

Chapter 7: Baseball rituals, pigeons, and why great sportsmen feel miserable after winning

The experiment with the pigeons: the pigeons witnessed a random connection between a particular kind of behavior and a desired connection, and wrongly inferred that the relationship was causal.

The caveman: A tendency to perceive causal connections that don't actually exist can confer huge evolutionary benefits, providing a cocoon of safety in a turbulent and dangerous world. The only proviso is that your superstitions must not impose too much of a burden on those occasions when they are without foundations.

Robert Louis Stevenson: To travel hopefully is better than arriving.

Many emotions are universal: hardwired into the brain at birth rather than learned through contact with any particular culture. Why? Because they are evolved traits rather than cultural creations, designed by natural selection to facilitate survival and gene propagation. Our common emotional heritage binds humanity together in a way that transcends cultural differences.

Anticlimax: we might feel miserable after a triumph. This is so that we are able to disengage from our triumph, enabling us to focus on the next challenge. If goal fulfillment induced indefinite periods of contentment, we would be robbed of all future motivation. For an award-winning writer, it is the melancholy hat provides the creative impetus for the next literary adventure.

Chapter 8: Optical illusions and X-ray vision

The information that is provided through our eyes and ears are only loosely connected to the way we experience the world.

When we listen to a conversation in our own language, we hear a series of distinct words separated by tiny gap of silence. But no such silence actually exists. It is our knowledge of the grammatical structure of our language that enables us to retouch the acoustic information so that we hear it in a neatly structured form.

The key point in all this is that knowledge is not used merely to make sense of perceptions; knowledge is embedded in perceptions.

A key difference between experts and novices is that experts are better at extracting information from what's going on around them. Federer can anticipate the movements of a tennis ball more efficiently that the rest of us, not because he has better eyesight but because he know where to look and how to interpret the movement pattern of his opponent.

Over time we have developed the ability to sculpt perceptions using top-down knowledge; it provides immediacy. Instead of having to infer the existence of a face in a pattern of dots or the structure in mammogram, you can see it. It is there. The inference is, as it were, embedded in perception.

Attention is a resource with severe capacity limitations. Most of us have the same bandwidth available for conscious processing, but experts, by automating perceptual and motor programs, are able to create spare capacity.

(Example at p.217)

Chapter 10: Are black's superior runners?

Small populations have genetic traits that are often different from those of other populations; the short-limbed Inuit, for example, are different from aborigines.

The notion of race is so deeply embedded within the human psyche that there is collective blind spot when it comes to its use and meaning. We automatically put people of dark skin in a box marked black people, and assume that any trait shared by some is shared by all.

For those genes that there is variation, the vast majority of that variation – around 85 % - exists between individuals within population groups.

Seeing is not believing: only a tiny fraction of a person's genes have effects that the human eye can see. No single gene is sufficient for classifying human populations into systematic categories.

The Kenyan runners from the region Nandi: The biological theory of Nandi athletic superiority is pretty simple to understand. Distinctive body types are the consequence of population isolation, enabling the gene pool to drift apart from neighboring populations, aided an abetted by the forces of natural and sexual selection. (p. 253)

The pattern of success is not genetic despite being specific to certain populations. Social and economic factors are the primary factors driving the success of Kenyan distance running. The top Kenyan athletes are predominantly from areas of high altitude, even relative to the rest of Africa.

The over presentation of African-Americans in professional sport is almost precisely mirrored by an under representation in positions of economic power. This suggests that the sporting success of African-Americans is the consequence not of genetics but of unequal opportunities; the blacks are driven into pro sport due to barriers to entry in other spheres of economic life.